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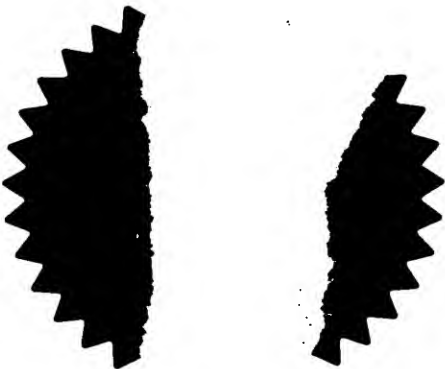
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Signed 

Dated 19 June 2003



- 6 NOV 2002

NEWPORT



06NOV02 E761322-2 D02748

P01/7700 0.00-0225841.6

# Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road  
Newport  
South Wales  
NP10 8QQ

1. Your reference	P0795		
2. Patent application number (The Patent Office will fill in this part)	0225841.6		6 NOV 2002
3. Full name, address and postcode of the or of each applicant (underline all surnames)	Aquaflow Laboratory Products Limited Baker Tilley Elgar House, Holmer Road Hereford Herefordshire HR4 9SS		
Patents ADP number (if you know it)			
If the applicant is a corporate body, give the country/state of its incorporation	United Kingdom	8499691001	
4. Title of the invention	VALVE ARRANGEMENT AND ASSEMBLY FOR DISPENSING A LIQUID FROM A CONTAINER TO AN ANIMAL		
5. Name of your agent (if you have one)	DEREK JACKSON ASSOCIATES		
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)	The Old Yard, Lower Town Claines Worcester WR3 7RY		
Patents ADP number (if you know it)	7737554001		
6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number	Country	Priority application number (if you know it)	Date of filing (day / month / year)
7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application	Date of filing (day / month / year)	
8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:			
a) any applicant named in part 3 is not an inventor; or			
b) there is an inventor who is not named as an applicant; or	Yes		
c) any named applicant is a corporate body.			
See note (d))			

## Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description 14

Claim(s)

Abstract

Drawing(s) 4

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination (*Patents Form 10/77*)

Any other documents  
(please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

Date 5 Nov 2002

12. Name and daytime telephone number of person to contact in the United Kingdom

Derek Jackson - Tel : 01905 755180

### Warning

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### Notes

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- d) If you have answered 'Yes' Patents Form 7/77 will need to be filed.
- e) Once you have filled in the form you must remember to sign and date it.
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- 1 -

VALVE ARRANGEMENT AND ASSEMBLY FOR DISPENSING A LIQUID  
FROM A CONTAINER TO AN ANIMAL

This invention relates to a valve arrangement for fitting  
5 to a container enclosing a liquid, for dispensing the  
liquid from the container to a mouth of an animal, on  
demand of the animal. The invention also relates to an  
assembly of such a valve arrangement and container.

10 The invention is particularly, but not exclusively,  
applicable to a valve arrangement and assembly for  
supplying water, or other liquid, to a laboratory animal,  
such as a rabbit, primate, mouse or rat, in a cage.

15 It is known to supply caged animals in a laboratory with  
water provided in an inverted bottle fitted with a metal  
spout. As water is drawn by the animal from the bottle,  
a vacuum forms inside the bottle. When such a vacuum  
becomes great enough, air is drawn into the bottle  
20 through the spout to relieve the vacuum. However, such  
indrawn air is also accompanied by residual water in the  
spout which has been in contact with the mouth of the  
animal. Such air and water also contain micro-organisms  
and food debris from the mouth of the animal, which  
25 rapidly contaminate the water, rendering it unfit for the  
animal to drink. As a result, the entire assembly has to

be regularly cleaned, sterilised and replenished, for example twice a week.

Although the cleaning procedure can be mechanised, it is  
5 expensive, being wasteful of water and also involving the use of corrosive and aggressive chemicals and steam sterilising equipment.

It is also known to provide automated watering systems in  
10 which water is piped around a building to valves provided in the cages. However, flow rates are very slow and the water is readily contaminated unless flushed away. This is very wasteful of water.

15 It is an object of the present invention to overcome or minimise this problem.

According to one aspect of the present invention there is provided a valve arrangement adapted to be fitted to a  
20 sealed container enclosing a liquid, for dispensing the liquid from the container to a mouth of an animal, on demand of the animal, the valve arrangement comprising a first tube portion adapted to pierce a seal means of the container to receive the liquid in the container, a  
25 second tube portion for accommodation by the mouth of the animal, and an internal valve means adapted to be

actuated by the animal to permit the animal to drink the liquid.

According to another aspect of the present invention  
5 there is provided an assembly for dispensing a liquid  
from a container to a mouth of an animal, on demand of  
the animal, the assembly comprising a sealed container of  
the liquid and a valve arrangement fitted thereto, the  
container being of bag form and comprising a flexible  
10 material, the valve arrangement comprising a first tube  
portion piercing a seal means of the container to receive  
the liquid in the container, a second tube portion for  
accommodation by the mouth of the animal, and an internal  
valve means adapted to be actuated by the animal to  
15 permit the animal to drink the liquid.

The container of bag form may be hermetically sealed and  
is suitably arranged to collapse under atmospheric  
pressure as the liquid is dispensed therefrom to the  
20 animal.

The container of bag form may be provided within an outer  
wrapping to maintain sterility of the container prior to  
use.  
25

The container of bag form may comprise a non-toxic material, such as a plastics material, which is preferably selected so as to be capable of being sterilised such as by means of steam or by subjection to  
5 radiation, such as gamma radiation.

The container of bag form may be provided with means for suspending it from suitable support means. Such means for suspending the container may comprise one or more  
10 sealed apertures therethrough, which may be provided at an opposite end of the container to the seal means pierced, or adapted to be pierced, by the first tube portion of the valve arrangement.

15 The seal means of the container pierced, or adapted to be pierced, by the first tube portion of the valve arrangement, may comprise a membrane or septum which may be arranged in a connecting tube extending from the container and may be covered by a removable cap until  
20 access thereto for piercing is required.

The seal means is arranged to be pierced by the first tube portion of the valve arrangement without leakage of the liquid occurring between the seal means and an  
25 exterior of the first tube portion, the first tube



portion forming an interference fit in the pierced seal means.

The first tube portion of the valve arrangement may have  
5 an end thereof shaped to form one or more sharply angled or pointed regions, which facilitate piercing of the seal means by the first tube portion.

The first tube portion may be coaxially linearly aligned  
10 with, or at an angle to, the second tube portion of the valve arrangement.

The valve arrangement, or at least one of the portions thereof, may be dimensioned according to size and/or  
15 drinking requirements, such as rate of flow or volume of the liquid, of the animal by which it is to be used.

The first and second portions of the valve arrangement may be formed as an integral unit, or the portions may be  
20 formed separately and assembled together, such as by threaded engagement.

The valve arrangement may be arranged for securing directly or indirectly to a structure, such as a cage,  
25 associated with the animal. Such securing may be by one or more clips, ferrules or threaded caps and/or by way of

a bracket or cradle. Alternatively, the valve arrangement may be arranged to be fitted to the container and the container arranged to be secured to the structure.

5

A finger grip arrangement may be provided on the valve arrangement to facilitate fitting of the valve arrangement to the bag-form container. The finger grip arrangement may be concentrically arranged on the valve  
10 arrangement and may comprise two threadedly-engaging portions which may be positioned one at each side of a support. Such support may be a portion of a cage for containing the animal, or a bracket or cradle such as for securing to a cage for containing the animal.

15

The valve means inside the valve arrangement may comprise a pin, such as of stainless steel, having a head portion engaging an apertured seal, such as of rubber, the pin having an end extending from the second tube portion of  
20 the valve means and adapted to be contacted by the animal to raise the head portion from the seal against force of a spring, such as of stainless steel, to permit flow of the liquid through the valve arrangement from the container.

25

The first and second tube portions of the valve arrangement may comprise metal, such as stainless steel, or plastics material.

- 5 The liquid in the sealed container may be water, which may be sterilised water, or may be a treatment liquid such as comprising medication or experimental test material.
- 10 The animal may be a laboratory animal or other domestic animal.

By means of the present invention, liquid such as water is supplied from the sealed container to the animal on  
15 demand, with minimal risk of back-contamination of remaining liquid in the container. This is achieved by means of the sealed bag-form flexible container and the associated valve arrangement with its container-piercing facility. Collapsing of the flexible container under  
20 atmospheric pressure as the liquid is withdrawn therefrom prevents formation of a vacuum inside the container and minimises any tendency for air and contaminants to be drawn back into the container.

- 25 For a better understanding of the present invention and to show more clearly how it may be carried into effect,

reference will now be made by way of example to the accompanying drawings in which:

Figure 1 is a perspective view of a container with  
5 liquid, and a valve arrangement, according to the present invention, prior to assembly;

Figure 2 is a cross-sectional view of the valve  
arrangement of Figure 1;  
10

Figure 3 is a perspective view of the container with liquid and the valve arrangement of Figure 1, after assembly;

15 Figure 4 is a perspective view of an alternative embodiment of a first tube portion of the valve arrangement of Figure 1;

Figure 5 is a perspective view of a disassembled  
20 alternative embodiment of the valve arrangement of Figure 1, for securing in an aperture in a support;

Figure 6 is a side view of the embodiment of the valve arrangement of Figure 5, after assembly in the aperture  
25 in the support; and

a thin plastics membrane or septum 14. The end of the connecting tube is covered by a cap 16, which can be removed by subjecting it to a twisting motion.

5 The container 6 has one or more sealed apertures 18 through it at an opposite end to the seal means 10, to enable the container 6 to be suspended from a support means 20.

10 A valve arrangement 22 is provided comprising a first tube portion 24 having an end shaped to form one or more sharply angled or pointed regions 26. The valve arrangement 22 has a second tube portion 28 for accommodation by the mouth 8 of the animal.

15

The first and second tube portions 24, 28 may be formed as an integral unit, or formed separately and assembled together. They may comprise metal, such as stainless steel, or a suitable plastics material.

20

As shown in Figure 2, the valve arrangement 22 incorporates a valve means, which suitably comprises a pin 30, such as of stainless steel, having a head portion 32 engaging an apertured seal 34, such as of rubber. The  
25 pin 30 has an end 36 extending from the second tube portion 28 of the valve means 22 and adapted to be

contacted by the mouth 8 of the animal to raise the head  
portion 32 from the seal 34, against force of a spring  
38, which suitably comprises stainless steel. The valve  
means is thereby opened to permit flow of liquid through  
5 it.

The valve arrangement 22 is provided with a finger grip  
arrangement 40.

10 Referring now to Figure 3, the cap 16 on the seal means  
10 is removed and the valve arrangement 22 is fitted to  
the container 6 by holding the finger grip arrangement 40  
and piercing the membrane or septum 14 of the seal means  
10 by pushing through it the sharply angled or pointed  
15 region 26 at the end of the first tube portion 24. The  
first tube portion 24 forms a sealed interference fit in  
the hole formed by piercing the membrane or septum 14 and  
such that no leakage of liquid 4 occurs between the  
membrane or septum 14 and an exterior of the first tube  
20 portion 24.

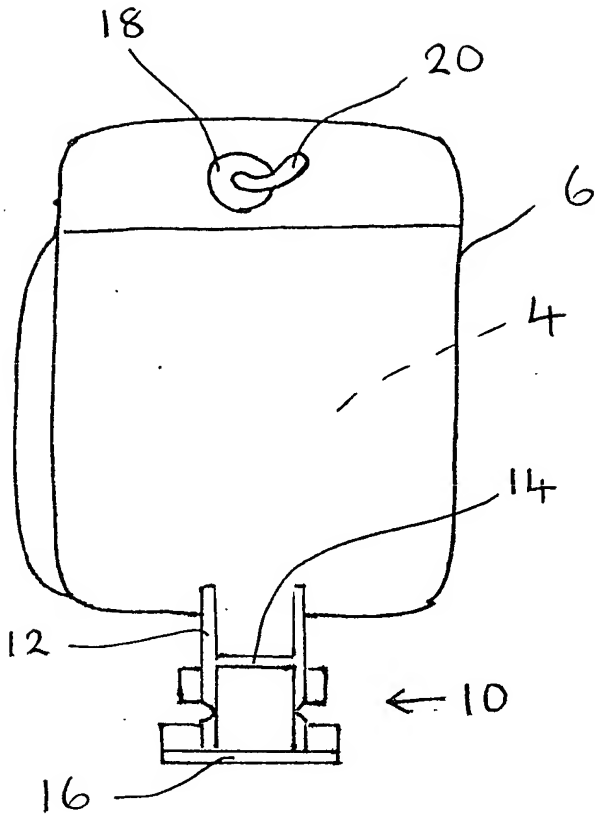
The valve arrangement 22 is suitably secured directly or  
indirectly to a structure, such as a cage associated with  
the animal. Such securing may simply comprise the  
25 support means 20 of the container 6. However, one or

may require higher rates of flow and/or volume of the liquid 4. To meet such requirements a valve arrangement 22 such as shown in Figure 7 can be provided, having a larger second tube portion 28 incorporating larger internal valve means 32, 34. Such larger second tube portion 28 is suitably threaded at a region 50 onto a component 52 incorporating the first tube portion 24. Again, a support (not shown) can be provided between the two threaded portions.





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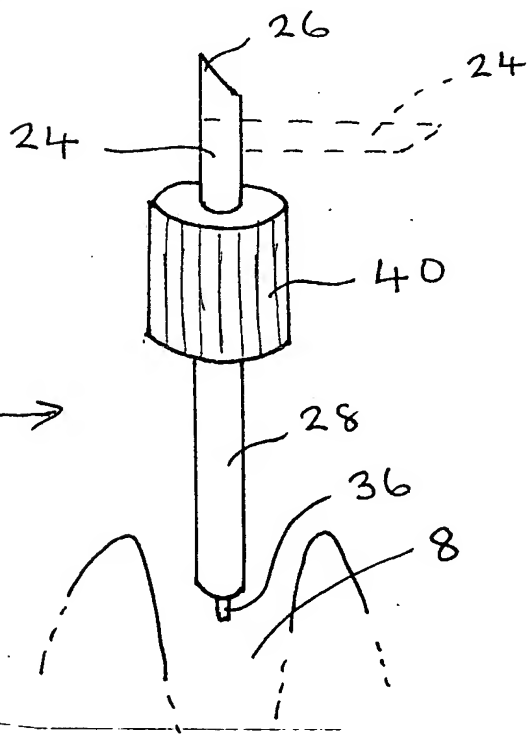


FIG. 1

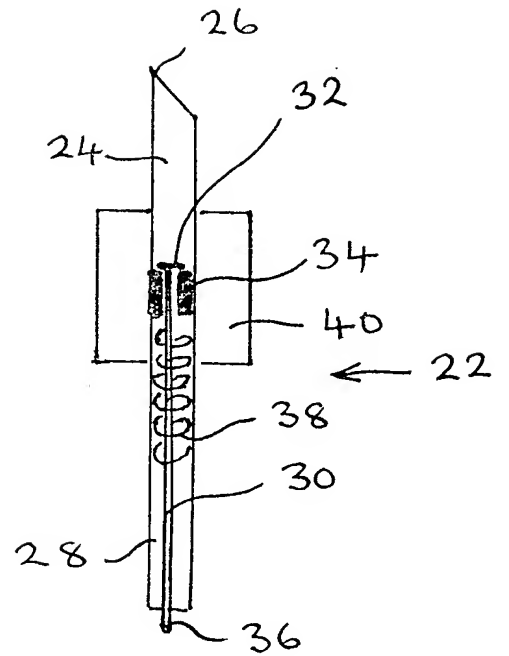


FIG. 2

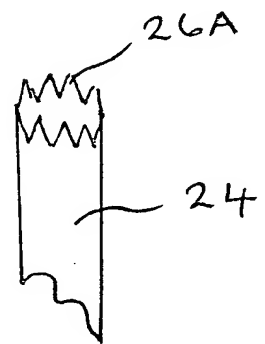


FIG. 4



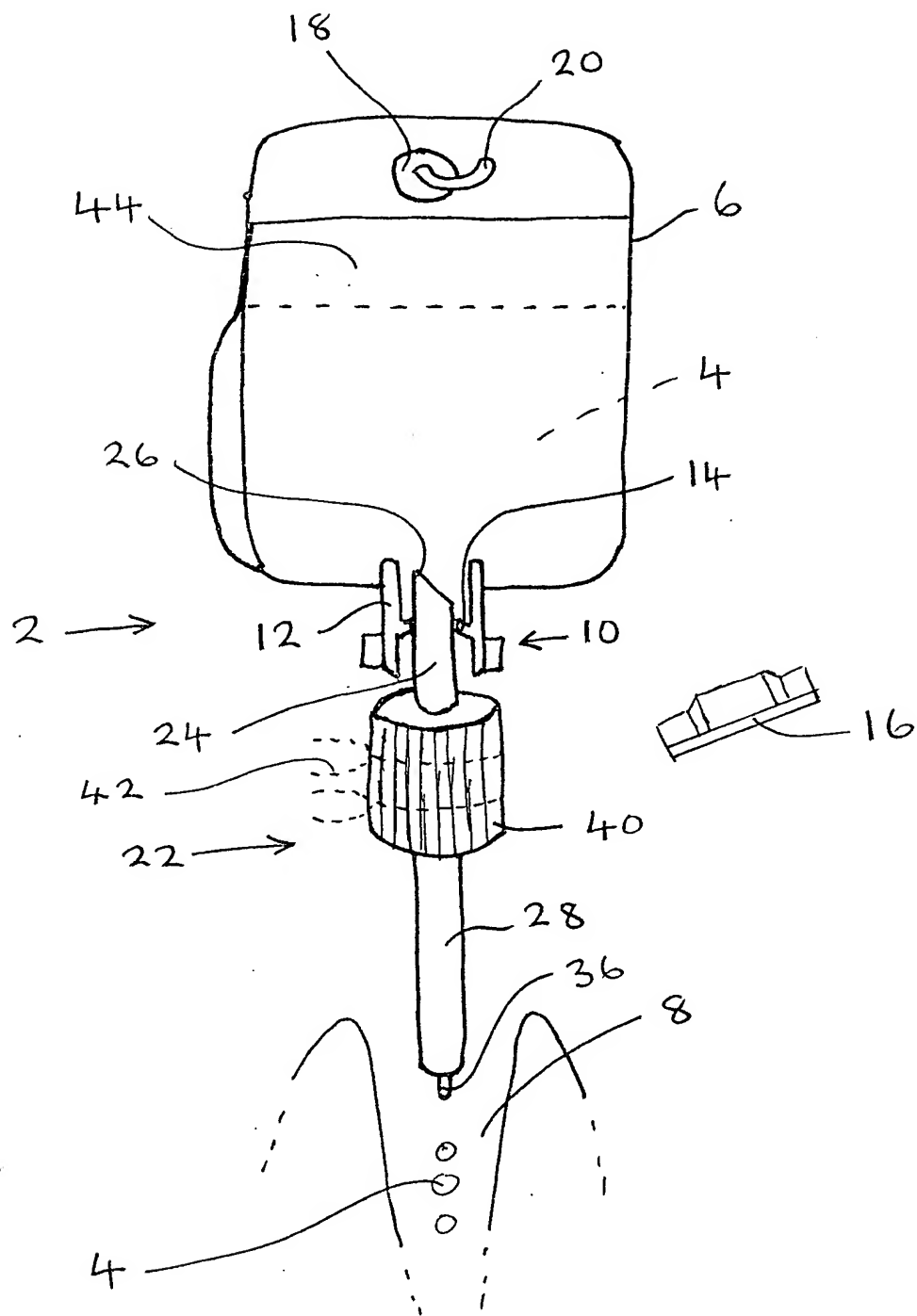


FIG. 3



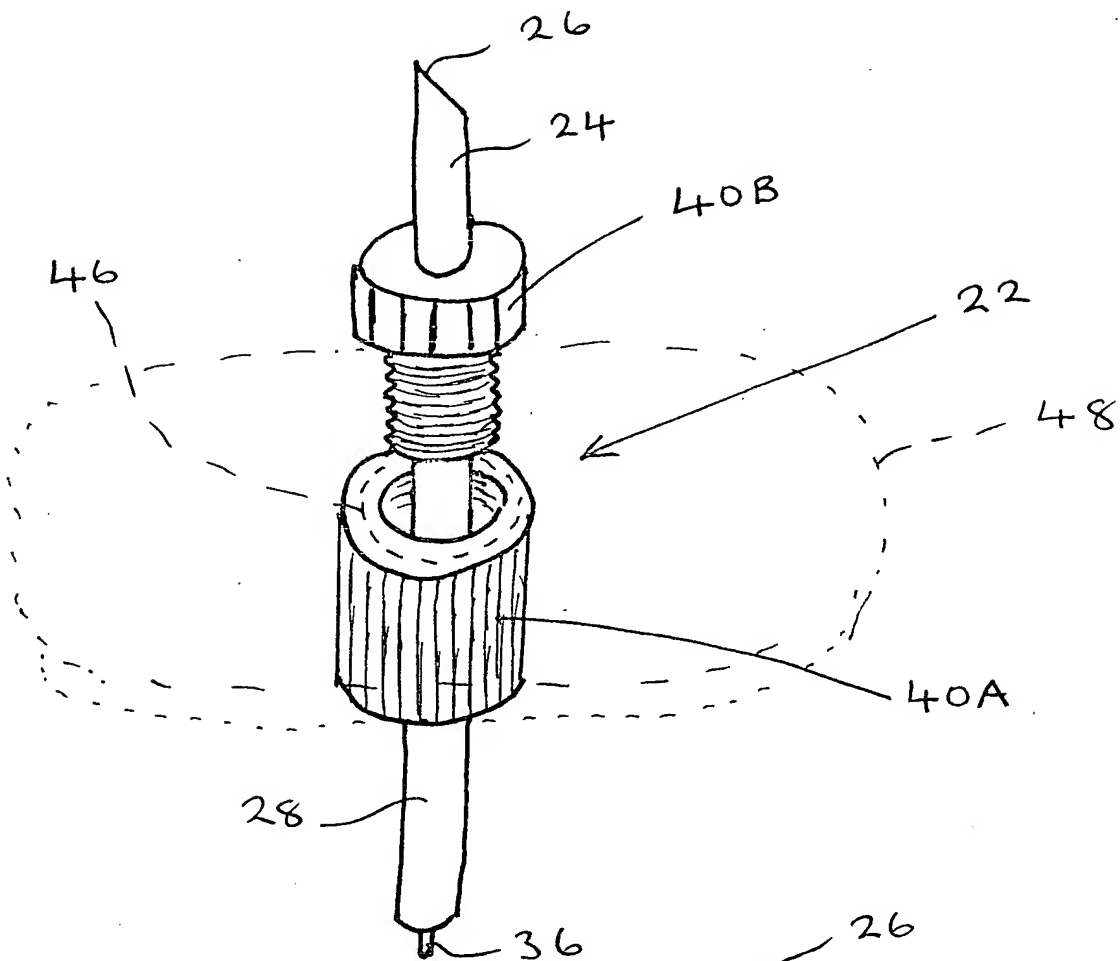


FIG. 5

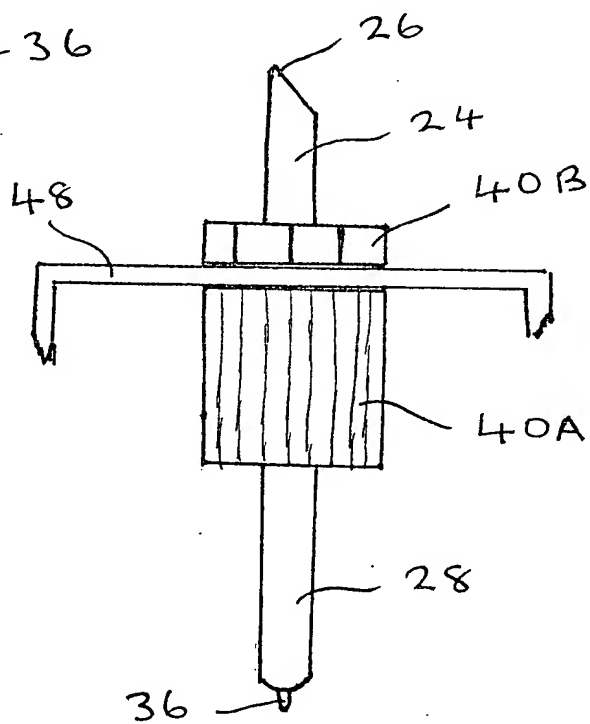


FIG. 6



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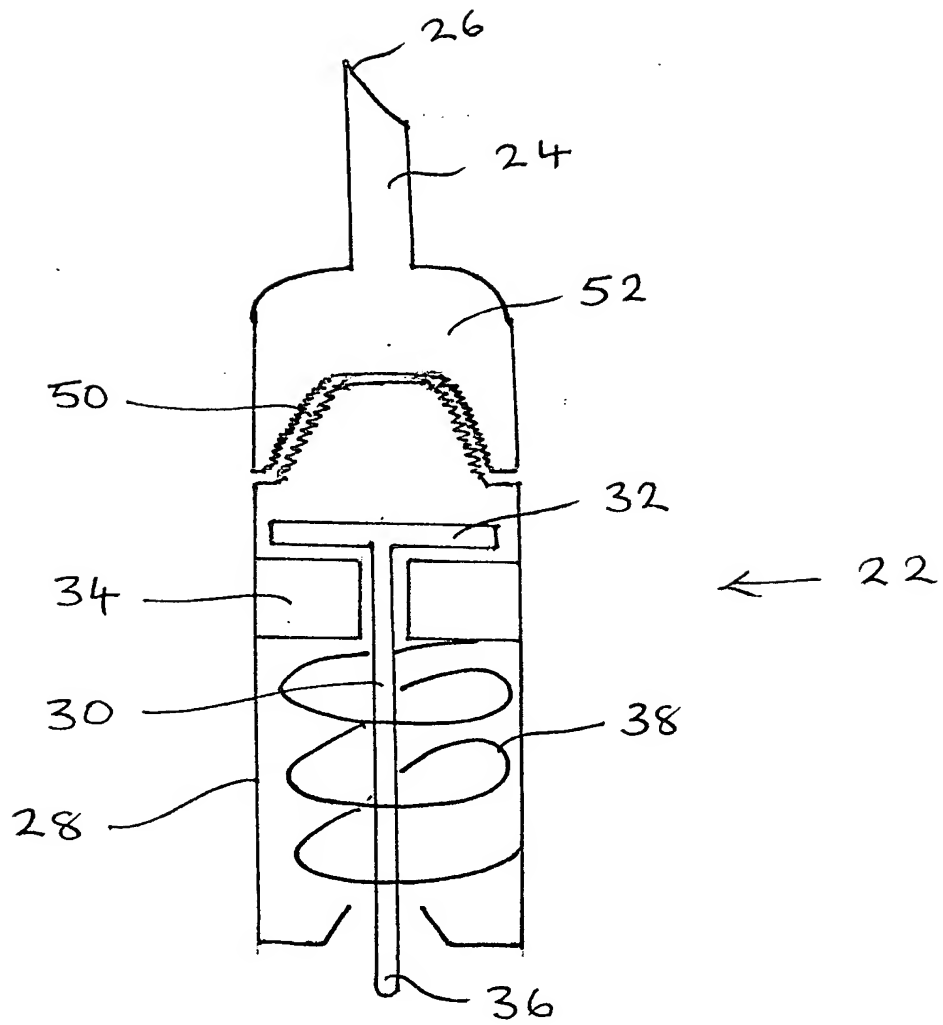


FIG. 7

